

Removal of Cu (II) and Cd (II) ions from environmental water samples by using Cellulose Acetate Membrane

ABSTRACT

Cellulose Acetate Membrane (CAM) which has been prepared by using a casting technique was utilized as an adsorbent for heavy metal ions adsorption. The CAM was characterized by Field Emission Scanning Electron Microscopy (FESEM), BET surface area (BET) and Fourier Transform Infrared Analysis (FTIR). The adsorption of Cu (II) and Cd (II) ions on CAM were investigated. The influences of several variables such as pH, adsorbance dosage, initial metal concentration, kinetic parameter, desorption and reusability on the adsorption capacity of the CAM was investigated in a batch adsorption mode. The adsorption capacity increased with the increasing of initial concentration of Cu (II) and Cd (II) solutions and followed the Freundlich model and pseudo second order kinetic mechanism. Desorption of metal ions was accomplished with 1 M Sulphuric acid and Hydrochloric acid solution for Cu (II) and Cd (II) ions. The adsorption capacity did not change significantly in reusability study when three adsorption experimental cycles were conducted. In conclusion, CAM is possible to be used as an alternative adsorbent for the removal of heavy metal ions from environmental water samples.

Keyword: Heavy metal ions; Cellulose acetate; Membrane; Adsorption studies